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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:	
Koperda, et al.	
Serial No.: 09/588,211	Examiner: Jason D. Cardone
Filed: June 6, 2000	Art Unit: 2142
For **SYSTEM AND METHOD FOR PROVIDING STATISTICS FOR FLEXIBLE BILLING IN A CABLE ENVIRONMENT**	Technology Center: 2100 SA Ref. No.: A - 6553 TKHR Ref. No.: 191910-1061

APPEAL BRIEF UNDER 37 C.F.R. §1.192

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Appeal Brief under 37 C.F.R. §1.192 is submitted in triplicate in support of the Notice of Appeal filed April 18, 2003, responding to the Advisory Action of January 30, 2003.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those which may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefor (including fees for net addition of claims) are hereby authorized to be charged to Deposit Account No. 20-0778.

REAL PARTY IN INTEREST

The real party in interest of the instant application is Scientific-Atlanta, Inc., having its principal place of business in Lawrenceville, GA. This ownership interest is embodied in an assignment recorded on March 14, 1997, at reel 8493, frame 0603.

RELATED APPEALS AND INTERFERENCES

There are no known related appeals or interferences that will affect or be affected by a decision in this appeal.

STATUS OF CLAIMS

Claims 1 – 18 were cancelled without waiver, disclaimer, or prejudice in the First Response. Claims 19 – 28 are pending in the application and stand finally rejected under 35 U.S.C. §103(a). To this point, claims 19 – 28 have not been amended during examination, and no amendments remain to be entered subsequent to the final Office Action. Applicants hereby appeal the foregoing final rejection.

STATUS OF AMENDMENTS

This application was originally filed on June 6, 2000, with claims 1 – 28. A non-final Office Action was mailed from the U.S. Patent and Trademark Office ("PTO") on May 2, 2002, rejecting claims 1 – 28. A First Response was filed with the PTO on August 7, 2002, canceling claims 1 – 18 without waiver, disclaimer, or prejudice. A Final Office Action was then mailed from the PTO on October 18, 2002, in which claims 19 – 28 were finally rejected. A Second Response was filed with the PTO on January 21, 2003. An Advisory Action was mailed from the

PTO on April 18, 2003, maintaining the final rejection of claims 19 – 28. The final rejection of claims 19 – 28 is appealed.

SUMMARY OF THE INVENTION

In general, the present invention relates to gathering usage statistics for billing users of data services in a cable television network. Independent claim 19 relates to monitoring the "amount of data flowing from [a] network access device . . . and the connect time of each connected device." (Page 5, lines 24 – 25) Also, page 18 specifies that the statistics collected include the "Total amount of data transmitted (for example in an ATM network, a total number of cells.)" (Page 18, lines 19 – 20) The statistics allow generation of "subscriber bills that utilize the connection information to charge for the amount of network resources actually used during the preceding billing period." (Page 30, lines 3 – 4)

Claim 21 depends from claim 19 and adds an element that includes "obtain[ing the] amount of actual data transferred and billing proportion[ally]." FIGs. 2, 2A, and 3 show various forward error control (FEC) blocks 211, 203, 255, 258, 307, and 309 that can be used to detect and/or correct data errors. Claim 23 specifies a plurality of tiers of service, which may be based on quality of service. (Page 7, lines 23 – 29) Claim 24 describes a billing structure based on the amount of data transmitted. (Page 18, lines 19 – 20 and page 30, lines 3 – 4) Claim 25 adds an element on monitoring jitter and delay (Page 3, lines 16 – 21; page 4, line 6 and lines 27 – 29; page 5, lines 1, 13, and 20; and page 6, line 7), while claim 26 includes a preauthorized level of service. (Page 4, line 11; page 5, line 1 and lines 11 – 23; and page 7, lines 23 – 29) Finally, claim 28 includes a limitation of the "amount of data transferred and [the] amount of data lost."

ISSUES

The following issues need to be decided as part of this appeal:

1. Whether claims 19 – 28 are patentable under 35 U.S.C. §103(a) with respect to U.S. Patent 6,249,532 to *Yoshikawa et al.* in view of U.S. Patent 5,751,706 to *Land et al.*

GROUPING OF CLAIMS

The claims are divided into seven (7) claim groupings, as set out below. For the purposes of the argument set forth in this appeal brief, one claim from each group will be evaluated and discussed in connection with the cited art. The claim groups include:

1. Claim Group I, which comprises independent claim 19 and dependent claims 20, 22, and 27;
2. Claim Group II, which comprises dependent claim 21;
3. Claim Group III, which comprises dependent claim 23;
4. Claim Group IV, which comprises dependent claim 24;
5. Claim Group V, which comprises dependent claim 25;
6. Claim Group VI, which comprises dependent claim 26; and
7. Claim Group VII, which comprises dependent claim 28.

REASONS THAT THE CLAIM GROUPS DO NOT STAND OR FALL TOGETHER

Although, in reality, all claims of an application are distinct, Applicants have grouped the claims of the present application into seven distinct claim groups. The claims for any given

group do not stand or fall with any claims of another group because the claims are of differing scope, which is set out in more detail below.

Claim Group I includes independent claim 19 and dependent claims 20, 22, and 27. Independent claim 19 has the broadest scope of the still pending claims as all the other still pending claims depend on claim 19 directly or indirectly.

Claim Group II includes dependent claim 21, which adds a limitation to independent claim 19 of Group I. This combination of elements, and particularly this additional limitation, is patentably distinct and is not found in the combination of *Yoshikawa* in view of *Land* as a whole.

Claim Group III includes dependent claim 23, which adds a limitation to independent claim 19 of Group I. This combination of elements, and particularly this additional limitation, is patentably distinct and is not found in the combination of *Yoshikawa* in view of *Land* as a whole.

Claim Group IV includes dependent claim 24, which adds a limitation to independent claim 19 of Group I. This combination of elements, and particularly this additional limitation, is patentably distinct and is not found in the combination of *Yoshikawa* in view of *Land* as a whole.

Claim Group V includes dependent claim 25, which adds a limitation to independent claim 19 of Group I. This combination of elements, and particularly this additional limitation, is patentably distinct and is not found in the combination of *Yoshikawa* in view of *Land* as a whole.

Claim Group VI includes dependent claim 26, which adds a limitation to independent claim 19 of Group I. This combination of elements, and particularly this additional limitation, is patentably distinct and is not found in the combination of *Yoshikawa* in view of *Land* as a whole.

Claim Group VII includes dependent claim 28, which adds a limitation to independent claim 19 and dependent claim 27 of Group I. This combination of elements, and particularly this

additional limitation, is patentably distinct and is not found in the combination of *Yoshikawa* in view of *Land* as a whole.

THE ARGUMENT

Claims 19 – 28 presently stand finally rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent 6,249,532 to *Yoshikawa et al.*, hereinafter *Yoshikawa*, in view of U.S. Patent 5,751,706 to *Land et al.*, hereinafter *Land*. In order for a claim to be properly rejected under 35 U.S.C. §103, the combined teachings of the prior art references must suggest all features of the claimed invention to one of ordinary skill in the art. See, *e.g.*, *In Re Dow Chemical*, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988), and *In re Keller*, 208 U.S.P.Q.2d 871, 881 (C.C.P.A. 1981). Applicants submit that *Yoshikawa* in view of *Land* as a whole does not suggest all the features of the claimed invention.

Claim Group I (Claims 19, 20, 22, and 27)

Claim 19 presently stands rejected under 35 U.S.C. §103 as allegedly being unpatentable over *Yoshikawa* in view of *Land*. Pending independent claim 19 includes the following features:

> monitoring ***session duration*** of a link to a network access device and storing data related thereto,
> monitoring ***amount of data*** transferred ***to and from*** a network access device and storing data related thereto, and
> monitoring amount of data lost in said link and storing data related thereto,
> the statistics permitting a flexible billing structure.

(Emphasis added.)

Applicants respectfully submit that the prior art of record is legally inadequate to render claim 19 obvious, because the references, either individually or in combination, do not teach or

reasonably suggest the foregoing features. Therefore, Applicants respectfully request that the rejections to pending independent claim 19 and its dependent claims 20 – 28 be withdrawn.

First, neither *Yoshikawa* nor *Land* monitor the "amount of data transferred" as recited in claim 19. Instead, col. 3, lines 54 – 55 of *Yoshikawa* describe "monitoring a program received condition such as program received and time of receiving in minute[s]." However, arbitrary-length video programs are not measurement units for an "amount of data" as recited in independent claim 19. Furthermore, at most, "time of receiving in minutes" arguably would only relate to session duration. This point is further illustrated in col. 7, line 67 through col. 8, line 5 of *Yoshikawa*, which describes just "compressed video data ***portions*** [that are] each of m bytes[, where] m is a natural number from several hundreds to several thousands." As a full program could consist of any number of these compressed video data portions, a measurement of an "amount of data" in terms of video programs would have too much variability. Such a program measurement standard would not be useful in billing subscribers for the usage of the data services provided over a cable television network.

Video programs do not inherently bear any relation to the amount of network resources or network usage that might be needed to communicate the program. As non-limiting examples, the amount of data needed to transmit a program varies by many orders of magnitude according to factors such as, but not limited to, the resolution of the video program (*e.g.*, high definition or low definition), the coding procedures used to generate information bits from the video images, the compression schemes for the video, and/or the length or time duration of the video program. Thus, a program is not a reliable measurement standard for monitoring the "amount of data" transferred as recited in independent claim 19. Moreover, page 8 of Applicants' specification points out the difference, in one example, among others, between usage-based billing and program-based billing.

According to page 8, "Usage based billing pioneered by telecommunications companies is a new concept for cable companies. On the other hand, program based billing for services is a new concept for telecommunications service providers." Usage-based billing generally depends on measuring the usage of network resources that a subscriber consumes in utilizing a network service. However, because of the significant variability in the amount of network resources that might be consumed for different types, formats, and durations of video programs, the number of video program transfers is not a reasonable measurement of the "amount of data transferred" for usage-based billing of consumption of network resources. Thus, usage-based billing based on "amount of data" is different from program-based billing that is not correlated to at least some range of data amounts.

Network resource planning, resource allocation, and the billing of customers for the consumption of such resources generally is not feasible based on counting the number of programs unless there is an inherent association between a program and at least an approximate amount of data. While some amounts of data, such as packets, may be variable length, most protocols specify minimum and/or maximum packet sizes to allow network equipment to be built with buffers (*i.e.*, resources within network equipment) to handle packets within those size constraints. Thus, the "amount of data" does not have to be measured using a fixed-size standard, but the completely unbounded size (on both the low end and the high end) of using a "program" as a measurement unit for an "amount of data" would make it relatively infeasible to perform management, allocation, and/or billing for usage of network resources. Usage-based billing generally relates to charging customers based on how much of the scarce supply of network resources that a customer uses. Program-based billing is more often used to bill based on customer demand for a particular program. For example, often a pay-per-view program, such as a boxing match, may be broadcast

on a cable TV network, and additional customers on the same cable drop may legally tune into the broadcast, without increasing the required network resources as long as the customer pays the access fee.

In contrast to the video program billing of *Yoshikawa*, *Land* describes billing for phone calls that may be partially completed over the circuit-switched PSTN (public switched telephone network) and partially completed over a packet network using virtual-circuit packet switching technologies, such as Asynchronous Transfer Mode (ATM) and/or frame relay. Historically, telephone phone calls have been billed based on geographical distance (*e.g.*, local or long distance) and call duration. *Land* recognizes this historical billing procedure for phone calls in column 3, lines 40 – 47, which describe the information needed for usage billing of phone calls to include "full information on the originator, destination, duration, and length of the call." The originator and destination allow determination of the geographical distance of the call, such as but not limited to long distance or local, while the duration or call length determines how long the generally circuit-switched connection for phone calls is in use. *Land* goes on to state in col. 12, lines 5 – 20 that "a monitoring computer . . . may receive a message . . . noting the time each predetermined code is received, the time the call path is established, and the time the call is terminated." This is more evidence of the billing method in *Land* being based on call duration. However, this billing method in *Land* does not keep up with the "amount of data transferred" or "amount of data lost" as both are recited in independent claim 19.

Moreover, not only does *Yoshikawa* in view of *Land* as a whole not show monitoring the "amount of data transferred" as recited in claim 19, but also *Yoshikawa* in view of *Land* as a whole does not show monitoring the "amount of data transferred ***to and from*** a network access device." In general, cable television networks may have a downstream transmission direction from a cable

headend or distribution hub towards subscriber devices as well as an upstream transmission direction from subscriber devices towards a cable headend or distribution hub. As recited in independent claim 19, the invention monitors the "amount of data transferred ***to and from*** a network access device." In contrast, *Yoshikawa* just monitors the downstream transmission of video programs to network devices and not the upstream transmission from network devices.

In addition, *Yoshikawa* may describe the action of performing error checking on received data. However, nothing in *Yoshikawa* mentions "monitoring [the] ***amount of data lost***." Instead, *Yoshikawa* seems to suggest retransmitting data that is in error for a video program and/or not billing for a video program when the data has errors. However, this does not imply that *Yoshikawa* describes monitoring the "amount of data lost" as recited in independent claim 19. The Office Action admits that "*Yoshikawa* does not specifically disclose monitoring [the] amount of data lost in the link."

Nonetheless, the Office Action specifies that col. 15, line 41 – col. 17, line 62 of *Land* "disclose[]monitoring [the] amount of data lost in the link." However, *Land* makes no reference to lost or errored data. At most, col. 17, lines 43 – 45 of *Land* specify "monitoring the status of the communications path and deriving billing information from the monitoring." This statement of *Land* is simply too general to imply that the information being monitored is the amount of data being lost. *Land* specifically focuses on whether a connection-oriented phone call and associated virtual circuit have been completed/connected. The status monitoring of *Land* is directed towards monitoring whether a call/connection is completed over a circuited-switched network and virtual-circuit packet switched network. Nothing in *Land* discloses, teaches, or suggests that the status monitoring is related to "amount of data". Applicants respectfully submit that *Land* has been misread to include specific types of status monitoring that are not described at any place in the *Land*

reference. To the contrary the systems in *Land* maintain information related to monitoring call duration and distance including: "the time each predetermined code is received, the time the call path is established, [] the time the call is terminated[,] the failure of the destination to answer the call, the time the destination answered the call, and the time the destination terminated the call". (Col. 12, lines 8 – 15) This information in *Land* is maintained such that for "the successful establishment of a call path, the monitoring computer may generate an accounting and a bill, based on the duration of the call." (Col. 12, lines 16 – 18) Thus, the explicit language of *Land* not only does not describe monitoring "amount of data" transferred or lost, but also *Land* actually describes a technique of monitoring call duration that teaches away from monitoring "amount of data" transferred or lost. Applicants respectfully submit that this statement about *Land* seems to be the primary argument in the Office Action. Many of the other arguments seem fairly conclusory and just recite Applicants' claim language while referencing large sections of the *Yoshikawa* and *Land* specifications without specifying with enough particularity the exact lines where the references supposedly disclose Applicants' claim elements.

Furthermore, *Yoshikawa* seems to be related to downloading cable TV video programs for pay-per-view type services. In contrast, *Land* seems to be related to using packet networks to augment the circuit-switched telephone network. Given the different markets and applications of cable TV networks and phone networks, it would not have been obvious to combine *Yoshikawa* with *Land*. For at least all of the above reasons, independent claim 19 is allowable over *Yoshikawa* in view of *Land* as a whole. Furthermore, dependent claims 20 – 28, which depend on independent claim 19, also are allowable over *Yoshikawa* in view of *Land* as a whole. Therefore, claim 19 is separately patentable.

Claim Group II (Claim 21)

In addition to being allowable as a dependent claim of allowable independent claim 19, claim 21 is also allowable because *Yoshikawa* in view of *Land* as a whole does not teach, disclose, or suggest "monitoring [the] amount of data lost" which would allow determination of the "amount of actual data transferred" to be calculated to perform "billing [that is] proportional" as recited in claim 21. Nothing in *Yoshikawa* or *Land* describes proportional billing based on subtracting out lost data. The Office Action cites col. 9 of *Yoshikawa*. However, col. 9, lines 35 – 38 of *Yoshikawa* specify that "it is possible to reduce or even cancel the bill for the subscriber when the reception of the program is difficult due to transmission error which can be determined by using the error information." Neither reducing nor canceling the bill would inherently be "proportional billing." Thus, *Yoshikawa* seems to indicate the non-proportional billing of not billing a customer at all for a video program if the video program has errors. In addition, the Office Action specifies that col. 15, line 41 – col. 17, line 62 of *Land* describes monitoring the amount of data lost in the link. However, *Land* makes no reference to lost or errored data. At most, col. 17, lines 43 – 45 of *Land* specify "monitoring the status of the communications path and deriving billing information from the monitoring." This statement of *Land* is simply too general to imply that the information being monitored is the amount of data being lost. Therefore, in addition to depending on allowable independent claim 19, claim 21 has at least one additional limitation than claim 19 that further makes the combination of elements in claim 21 allowable over *Yoshikawa* in view of *Land* as a whole. For at least these reasons, claim 21 is separately patentable. The Office Action only makes a one sentence conclusory recitation of Applicants' claim language while only identifying large portions of the specifications of *Yoshikawa* and *Land*. Applicants are unable to find specific language in the references of *Yoshikawa* and *Land* that renders unpatentable Applicants' claim 21.

Claim Group III (Claim 23)

In addition to being allowable as a dependent claim of allowable independent claim 19, claim 23 is also allowable because neither *Yoshikawa* nor *Land* teach, disclose, or suggest "service tiers depending on maximum shared bandwidth or bit rate." According to the Final Office Action, col. 7, lines 27 – 53 of *Yoshikawa* describe tiers of service. That portion of Yoshikawa generally describes figure 6. However, the shared bandwidth of cable 630 is not described with respect to different tiers of service to allow differentiated service levels of using network resources at different subscriber locations 641, 642, 643, and 644. Furthermore, col. 15, line 59 through col. 16, line 27 of *Land* does not describe different tiers of service at all. That portion of *Land* just describes establishing a call over a packet network. Nothing specifies the way different users may control different service levels or tiers of service. Thus, in addition to depending on allowable independent claim 19, claim 23 has at least one additional limitation than claim 19 that further makes the combination of elements in claim 23 allowable over *Yoshikawa* in view of *Land* as a whole. For at least these reasons, claim 23 is separately patentable. The Office Action only makes a one sentence conclusory recitation of Applicants' claim language, and Applicants are unable to find specific language in the references of *Yoshikawa* and *Land* that renders unpatentable Applicants' claim 23.

Claim Group IV (Claim 24)

In addition to being allowable as a dependent claim of allowable independent claim 19, claim 24 is also allowable because neither *Yoshikawa* nor *Land* teach, disclose, or suggest determining the "amount of actual data communicated during a session." The Office Action cites col. 8, lines 14 – 67 of *Yoshikawa* as implying that billing is based on the amount of actual data

communicated. However, the billing in *Yoshikawa* is based on programs, and nothing in *Yoshikawa* suggests billing based on a calculation of the amount of actual good data. The system in *Yoshikawa* generally would need to keep up with the amount of data transferred, and the units of "programs" transferred does not provide a calculation of the amount of data to be able to determine the "actual data." Furthermore, *Land* describes measurement of call duration as opposed to the amount of data transferred. Thus, in addition to depending on allowable independent claim 19, claim 24 has at least one additional limitation than claim 19 that further makes the combination of elements in claim 24 allowable over *Yoshikawa* in view of *Land* as a whole. For at least these reasons, claim 24 is separately patentable. The Office Action merely makes a one sentence conclusory recitation of Applicants' claim language, and Applicants are unable to find specific language in the references of *Yoshikawa* and *Land* that renders unpatentable Applicants' claim 24.

Claim Group V (Claim 25)

In addition to being allowable as a dependent claim of allowable independent claim 19, claim 25 is also allowable because neither *Yoshikawa* nor *Land* teach, disclose, or suggest monitoring the "jitter and delay." Jitter and transmission delay do not appear in *Yoshikawa* at all. The only "delay" reference in *Yoshikawa* is in col. 16, line 13 and refers to billing without delay. Thus, the argument of the existence of monitoring transmission delay in *Yoshikawa* within col. 8, lines 14 – 67 does not hold because a search of the electronic version of the *Yoshikawa* patent on the PTO's web site did not even find this term in the document. Furthermore, a similar search of the PTO' web site of *Land* did not find the term "jitter", while the word "delay" only appears in col. 2, lines 41 – 44, which states: "For voice transmission, this whole process would have to be done very quickly so that each participant in a voice telephone conversation would not notice any

unusual time delays." However, nothing in *Land* describes monitoring jitter and transmission delay. Thus, in addition to depending on allowable independent claim 19, claim 25 has at least one additional limitation than claim 19 that further makes the combination of elements in claim 25 allowable over *Yoshikawa* in view of *Land* as a whole. For at least these reasons, claim 25 is separately patentable. The Office Action makes a one sentence conclusory recitation of Applicants' claim language while only identifying large portions of the specifications of *Yoshikawa* and *Land.* Applicants are unable to find specific language in the references of *Yoshikawa* and *Land* that render unpatentable Applicants' claim 25.

Claim Group VI (Claim 26)

In addition to being allowable as a dependent claim of allowable independent claim 19, claim 26 is also allowable because neither *Yoshikawa* nor *Land* teach, disclose, or suggest "preauthorized level[s] of service." In some embodiments, the preauthorized level of service would affect the level of network resources that a subscriber is preauthorized to use. While *Yoshikawa* may authorize subscribers to decode and view video programs, video programs do not inherently correspond to specific amounts of network resources for usage-based billing. Thus, the "level[s] of service" are related to rights to use different amounts of network resources. *Land* also does not differentiate calls to allow different levels of service. Nothing in *Land* specifies how a subscriber might complete a higher service level call based on being preauthorized to do so. Instead the only service level in *Land* generally seems to be directed to providing voice phone calls through packet networks. No controller in *Land* seems to "regulate service at [a] preauthorized level." Instead, *Land* does not need such limits on data flows because the PSTN interfaces to the packet-based phone network in *Land* would effectively limit the amount of packetized voice data input to the

packet network such that no controller is needed to "regulate service" in *Land*. Thus, in addition to depending on allowable independent claim 19, claim 26 has at least one additional limitation than claim 19 that further makes the combination of elements in claim 26 allowable over *Yoshikawa* in view of *Land* as a whole. For at least these reasons, claim 26 is separately patentable. The Office Action just makes a one sentence conclusory recitation of Applicants' claim language, and Applicants are unable to find specific language in the references of *Yoshikawa* and *Land* that renders unpatentable Applicants' claim 26.

Claim Group VII (Claim 28)

In addition to being allowable as a dependent claim of allowable independent claim 19, claim 28 is also allowable because neither *Yoshikawa* nor *Land* teach, disclose, or suggest "amount of data transferred and amount of data lost." The billing in *Yoshikawa* is based on programs, which are not inherently related to an "amount of data." In *Land*, the billing is based at least partially on call duration as opposed to "amount of data transferred." *Land* does not describe determining amount of data lost at all. While *Yoshikawa* does describe determining data errors, nothing in *Yoshikawa* seems to describe determining the "***amount*** of data lost." Therefore, in addition to depending on allowable independent claim 19 and allowable dependent claim 27, claim 28 has at least one additional limitation than claims 19 and 27 that further makes the combination of elements in claim 28 allowable over *Yoshikawa* in view of *Land* as a whole. For at least these reasons, claim 28 is separately patentable. The Office Action just makes a one sentence conclusory recitation of Applicants' claim language, and Applicants are unable to find specific language in the references of *Yoshikawa* and *Land* that reads on Applicants' claim 28.

CONCLUSION

Applicants respectfully request that the Board of Appeals reverse the Examiner's rejections of all pending claims 19 – 28 and allow same for the reasons indicated.

Respectfully submitted ,

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APPENDIX TO THE APPEAL BRIEF UNDER 37 C.F.R. §1.192

The Appendix is incorporated into the foregoing Appeal Brief under 37 C.F.R. §1.192.

THE CLAIMS

19. (Original) A method of providing statistics for billing users of data services provided over a cable television network comprising the steps of

monitoring session duration of a link to a network access device and storing data related thereto,

monitoring amount of data transferred to and from a network access device and storing data related thereto, and

monitoring amount of data lost in said link and storing data related thereto, the statistics permitting a flexible billing structure.

20. (Original) The method of claim 19 further comprising the step of monitoring and storing the start time of the session.

21. (Original) The method of claim 19 further comprising the steps of subtracting the amount of lost data from the amount of transferred data to obtain an amount of actual data transferred and billing proportional to the amount of actual data transferred and session duration

22 (Original) The method of claim 19 further comprising the steps of recording the address of the network access devise and of apparatus to which said network access device is linked during said session.

23. (Original) The method of claim 19 further comprising the steps of providing a plurality of service tiers depending on maximum shared bandwidth or bit rate.

24. (Original) The method of claim 19 wherein said flexible billing structure comprises a fee determined by amount of actual data communicated during a session.

25. (Original) The method of claim 19 further comprising the step of monitoring quality of service provided a subscriber determined by additionally monitoring jitter and delay.

26. (Original) The method of claim 19 further comprising the step of storing preauthorized level of service data for subscribers, an administration computer communicating said preauthorized level of service to a link access controller for regulating service at said preauthorized level.

27. (Original) A method as recited in claim 19 further comprising the step of receiving parametric statistical data for a session of a network access device at an administration computer.

28. (Original) A method as recited in claim 27 wherein said parametric statistical data comprises amount of data transferred and amount of data lost.